What we claim is:

1) A method for the prophylactic or therapeutic treatment of *Streptococcus pneumoniae*, comprising:

administering to the site of an infection or colonization an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*.

2) The method according to claim 1, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

3) The method according to claim 1, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

4) The method according to claim 1, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, introducing said gene into a transfer vector, and cloning said transfer vector into an expression system.

5) The method according to claim 4, wherein said transfer vector is a plasmid.

6) The method according to claim 4, wherein said expression system is a bacteria.

7) The method according to claim 6, wherein said bacteria is selected from the group consisting of *E. coli* and *Bacillus*.

8) The method according to claim 4, wherein said expression system is a cell free expression system.

9) The method according to claim 1, further comprising delivering said lytic enzyme

in a carrier suitable for delivering said lytic enzyme to the site of the infection.

10) The method according to claim 9, wherein said carrier is selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, nasal drops, nasal ointments, nasal washes, nasal injections, gels, nasal packings, ointments, lozenges, troches, candies, injectants, chewing gums, tablets, powders, sprays, injectants, powders, and liquids.

11) The method according to claim 8, further comprising delivering a dry anhydrous version of the enzyme by an inhaler.

12) The method according to claim 1, further comprising delivering said lytic enzyme parenterally.

13) The method according to claim 12, wherein said lytic enzyme is delivered intravenously.

14) The method according to claim 12, wherein said lytic enzyme is delivered intramuscularly.

15) The method according to claim 12, wherein said lytic enzyme is delivered subdermally.

16) The method according to claim 12, wherein said lytic enzyme is delivered intrathecally.

17) The method according to claim 1, wherein said bacteriophage is selected from the group consisting of Dp-1, Dp-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ϖ-1, and ϖ-2.

18) The method according to claim 17, wherein said bacteriophage is Dp-1.

19) The method according to claim 1, further comprising an antibiotic.

20) A method for treating an upper respiratory tract illness or colonization caused by

Streptococcus pneumoniae, comprising administering to a mouth, throat, or nasal passage of a mammal a composition comprising an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme the cell wall of said *Streptococcus pneumoniae*.

21) The method according to claim 20, wherein said composition further comprises a carrier selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, nasal drops, nasal ointments, nasal washes, nasal injections, gels, nasal packings, ointments, lozenges, troches, candies, injectants, chewing gums, tablets, powders, sprays, injectants, powders, intravenous solution, and liquids..

22) The method according to claim 20, wherein said composition further comprises a buffer that maintains pH of the composition at a range between about 4.0 and about 9.0.

23) The method according to claim 22, wherein said buffer comprises a reducing reagent.

24) The method according to claim 23, wherein said reducing reagent is dithiothreitol.

25) The method according to claim 22, wherein said buffer comprises a metal chelating reagent.

26) The method according to claim 25, wherein said metal chelating reagent is ethylenediaminetetracetic disodium salt.

27) The method according to claim 22, wherein said buffer is a citrate-phosphate buffer.

28) The method according to claim 22, further comprising a bactericidal or bacteriostatic agent as a preservative.

29) The method according to claim 20, wherein said lytic enzyme is lyophilized.

30). The method according claim 20, wherein said at least one lytic enzyme is present in a concentration of about 100 to about 500,000 active enzyme units per milliliter of fluid in the wet environment of the nasal or oral passages.

31) The method according to claim 20, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

32) The method according to claim 20, wherein said composition is administered parenterally.

33) The method according to claim 20, wherein said lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

34) The method according to claim 20, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

35) The method according to claim 34, wherein said transfer vector is a plasmid.

36) The method according to claim 34, wherein said expression system is a bacteria.

37) The method according to claim 36, wherein said bacteria is selected from the group consisting essentially of *E. coli* and *Bacillus*.

38) The method according to claim 34, wherein said expression system is a cell free expression system.

39) A method of treating bacterial meningitis caused by *Streptococcus pneumoniae*, comprising administering a composition comprising an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall

of said *Streptococcus pneumoniae*.

40) The method according to claim 39, wherein said composition is administered parenterally.

41) The method according to claim 39, wherein said composition is administered intravenously.

42) The method according to claim 39, wherein said composition is administered subcutaneously.

43) The method according to claim 39, wherein said composition is administered intramuscularly.

44) The method according to claim 39, wherein said composition is administered intrathecally.

45) The method according to claim 39, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

46) The method according to claim 39, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

47) The method according to claim 46, wherein said transfer vector is a plasmid.

48) The method according to claim 46, wherein said expression system is a bacteria.

46) The method according to claim 48, wherein said bacteria is selected from the group consisting of *E. coli* and *Bacillus*. .

47) The method according to claim 43, wherein said expression system is a cell free

expression system.

48) The method according to claim 39, wherein said composition further comprises a carrier.

49) The method according to claim 48, wherein said carrier is selected from the group consisting of distilled water, a saline solution, albumin, a serum, Ringer's solution, a buffered solution, a dextrose solution, and combinations thereof.

50) The method according to claim 48, wherein said carrier comprises additives selected from the group consisting of p-hydroxybenzoates, stabilizers, fixed oils, ethyl oleate, neutral salts, dextrose, trehalose, dextrins, lactose, phosphate buffered saline, gelatin, albumin, vasoconstriction agents, organic acids organic acid salts, antioxidants, low molecular weight polypeptides, proteins, immunoglobulins, hydrophilic polymers, amino acids, monosaccharides, disaccharides, other carbohydrates including cellulose or its derivatives, glucose, chelating agents, sugar alcohols, counter-ions, non-ionic surfactants, glycerin, glycerol, DMSO, and combinations thereof.

51) A method for treating, preventing or ameliorating a *Streptococcus pneumoniae* infection at a mucosal surface, comprising the steps of :

a) obtaining a composition comprising an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*, and

b) applying said composition to the mucosal surface.

52) The method according to claim 51, wherein said bacteriophage is selected from the

group consisting of Dp-1, Dp-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ϖ-1, and ϖ-2.

53) A method of treating illnesses or infections of *Streptococcus pneumoniae*, comprising administering parenterally a composition comprising an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae* without affecting any other bacterial flora present.

54) The method according to claim 53, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

55) The method according to claim 53, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

56) The method according to claim 55, wherein said transfer vector is a plasmid.

57) The method according to claim 55, wherein said expression system is a bacteria.

58) The method according to claim 57, wherein said bacteria is selected from the group consisting of *E. coli* and *Bacillus*. .

59) The method according to claim 55, wherein said expression system is a cell free expression system

60) The method according to claim 53, further comprising delivering said lytic enzyme in a carrier suitable for delivering said lytic enzyme to the site of the infection.

61) A method for the treatment of a bacterial infection caused by *Streptococcus pneumoniae*, comprising the steps of:

(a) obtaining a composition comprising an effective amount of a lytic enzyme, said composition prepared by the steps of:

1) obtaining at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme has the ability to specifically lyse the cell wall of said Streptococcus pneumoniae;

2) admixing said at least one lytic enzyme to a carrier suitable for delivery of said at least one lytic enzyme to the site of the infection; and

(b) administering said composition.

62) The method according to claim 61, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae.*

63) The method according to claim 61, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system..

64) The method according to claim 63, wherein said transfer vector is a plasmid.

65) The method according to claim 63, wherein said expression system is a bacteria.

66) The method according to claim 65, wherein said bacteria is selected from the group consisting of *E. coli* and *Bacillus*.

67) The method according to claim 63, wherein said expression system is a cell free expression system.

68) The method according to claim 61, further comprising delivering said lytic enzyme in a carrier suitable for delivering said lytic enzyme to the site of the infection.

69) The method according to claim 68, wherein said carrier is selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, nasal drops, nasal ointments, nasal washes, nasal injections, gels, nasal packings, ointments, lozenges, ttroches, candies, injectants, chewing gums, tablets, powders, sprays, injectants, powders, and liquids.

70) The method according to claim 61, further comprising delivering a dry anhydrous version of the enzyme by an inhaler.

71) The method according to claim 61, wherein said lytic enzyme is delivered parenterally.

72) The method according to claim 71, wherein said lytic enzyme is delivered intravenously.

73) The method according to claim 71, wherein said lytic enzyme is delivered intramuscularly.

74) The method according to claim 71, wherein said lytic enzyme is delivered subdermally.

75) The method according to claim 71, wherein said lytic enzyme is delivered intrathecally.

76) The method according to claim 61, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ϖ-1, and ϖ-2..

77) The method according to claim 61, wherein said bacteriophage is Dp-1.

78) The method according to claim 61, further comprising an antibiotic.

79) The method according to claim 61, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

80) A method of treating eyes exposed to *Streptococcus pneumoniae*, comprising: administering to the eyes an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*.

81) The method according to claim 80, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

82) The method according to claim 80, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system..

83) The method according to claim 82, wherein said transfer vector is a plasmid.

84) The method according to claim 81, wherein said expression system is a bacteria.

85) The method according to claim 84, wherein said bacteria is selected from the group consisting of *E. coli* and *Bacillus*. .

86) The method according to claim 81, wherein said expression system is a cell free expression system

87) The method according to claim 80, further comprising delivering said lytic enzyme in a carrier suitable for delivering said lytic enzyme to the site of the infection.

88) The method according to claim 87, wherein said carrier is an eye drop solution.

89) The method according to claim 80, further comprising delivering a dry anhydrous version of the enzyme by an inhaler.

90) The method according to claim 80, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

91) The method according to claim 80, further comprising delivering said lytic enzyme parenterally.

92) The method according to claim 91, wherein said lytic enzyme is delivered intravenously.

93) The method according to claim 91, wherein said lytic enzyme is delivered intramuscularly.

94) The method according to claim 91, wherein said lytic enzyme is delivered subdermally.

95) The method according to claim 80, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746,

ω-1, and ω-2.

96) The method according to claim 95, wherein said bacteriophage is Dp-1.

97) A method for treating ear infections, comprising administering to a canal of an ear an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*.

98) The method according to claim 97, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

99) The method according to claim 97, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system..

100) The method according to claim 99, wherein said transfer vector is a plasmid.

101) The method according to claim 99, wherein said expression system is a bacteria.

102) The method according to claim 97, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

.103) The method according to claim 99, wherein said expression system is a cell free expression system

104) The method according to claim 97, further comprising delivering said lytic enzyme in a carrier suitable for delivering said lytic enzyme to the site of the infection.

105) The method according to claim 97, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ω-1, and ω-2..

106) The method according to claim 105, wherein said bacteriophage is Dp-1.

107) The method according to claim 97, further comprising an antibiotic.

108) The method according to claim 104, wherein said carrier is selected from the group consisting of vitamins, minerals, carbohydrates, sugars, amino acids, proteinacious materials, fatty acids, phospholipids, antioxidants, phenolic compounds, isotonic solutions, oil based solutions, oil based suspensions, and combinations thereof..

109) A method for preventing infection of contact lens solution by *Streptococcus pneumoniae*, comprising the steps of:

administering to said contact lens solution an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *said Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*.

110) The method according to claim 109, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

111) The method according to claim 109, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

112) The method according to claim 111, wherein said transfer vector is a plasmid.

113) The method according to claim 111, wherein said expression system is a bacteria.

114) The method according to claim 111, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

115) The method according to claim 111, wherein said expression system is a cell free expression system

116) The method according to claim 109, further comprising delivering said lytic enzyme in a carrier suitable for delivering said lytic enzyme to the site of the infection.

117) The method according to claim 109, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ϖ-1, and ϖ-2..

118) The method according to claim 117, wherein said bacteriophage is Dp-1.

119) The method according to claim 109, wherein said contact lens solution further comprising an antibiotic.

120) The method according to claim 109, wherein said contact lens solution is an isotonic solution.

121) The method according to claim 109, wherein said contact lens solution further comprises sodium chloride, sugar alcohols, borates, preservatives, and combinations thereof.

122) A method for treating endocarditis caused by *Streptococcus pneumoniae*, comprising administering to site of the infection an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for said *Streptococcus pneumoniae*,

wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*.

123) The method according to claim 122, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

124) The method according to claim 122, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system..

125) The method according to claim 124, wherein said transfer vector is a plasmid.

126) The method according to claim 124, wherein said expression system is a bacteria.

127) The method according to claim 122, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

.128) The method according to claim 124, wherein said expression system is a cell free expression system

129) The method according to claim 122, further comprising delivering said lytic enzyme in a carrier suitable for delivering said lytic enzyme to the site of the infection.

130) The method according to claim 122, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ω-1, and ω-2..

131) The method according to claim 130, wherein said bacteriophage is Dp-1.

132) The method according to claim 129, wherein said carrier is selected from the group consisting of distilled water, a saline solution, albumin, a serum, fixed oils, liposomes, ethyl oleate, and combinations thereof.

133) The method according to claim 132, wherein said carrier may further comprise preservatives, stabilizers, buffers, gelatin, a vasoconstriction agent, amino acids, antioxidants, polypeptides, hydrophilic polymers, sugar alcohols, chelating agents, sugars, counter ions, non-ionic surfactants, and combinations thereof.

134) The method according to claim 129, wherein said composition is administered parenterally.

135) The method according to claim 134, wherein said composition is administered intramuscularly.

136) The method according to claim 134, wherein said composition is administered intravenously.

137) The method according to claim 134, wherein said composition is administered subdermally.

138) A method for the prophylactic treatment of *Streptococcus pneumoniae*, comprising

administering to the site of carriage an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*.

139) The method according to claim 138, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

140) The method according to claim 138, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, introducing said gene into a transfer vector, and cloning said transfer vector into an expression system..

141) The method according to claim 140, wherein said transfer vector is a plasmid.

142) The method according to claim 140, wherein said expression system is a bacteria.

143) The method according to claim 142, wherein said bacteria is selected from the group consisting of wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

144) The method according to claim 140, wherein said expression system is a cell free expression system.

145) The method according to claim 138, further comprising delivering said lytic enzyme in a carrrier suitable for delivering said lytic enzyme to the site of the carriage..

146) The method according to claim 138, wherein said carrier is selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, nasal drops, nasal ointments, nasal washes, nasal injections, gels, nasal packings, ointments, lozenges, troches, candies, injectants, chewing gums, tablets, powders, sprays, injectants, powders, and liquids.

147) The method according to claim 138, further comprising delivering a dry anhydrous version of the enzyme by an inhaler.

148) The method according to claim 138, further comprising delivering a dry anhydrous

version of the enzyme by a bronchial spray.

149) The method according to claim 138, further comprising delivering said lytic enzyme parenterally.

150) The method according to claim 138, wherein said lytic enzyme is delivered intravenously.

151) The method according to claim 12, wherein said lytic enzyme is delivered intramuscularly.

152) The method according to claim 12, wherein said lytic enzyme is delivered subdermally.

153) The method according to claim 1, wherein said bacteriophage is selected from the group consisting of Dp-1, Dp-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ϖ-1, and ϖ-2.

154) The method according to claim 153, wherein said bacteriophage is Dp-1.

155) A method for the treating the carriage of *Streptococcus pneumoniae* in the upper respiratory tract illness, comprising administering to a mouth, throat, or nasal passage of a mammal a composition comprising an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme the cell wall of said *Streptococcus pneumoniae*.

156) The method according to claim 155, wherein said composition further comprises a carrier selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, nasal ointments, nasal injections, gels, nasal packings, ointments, lozenges, troches, candies, injectants,

chewing gums, tablets, powders, sprays, injectants, powders, intravenous solution, and liquids..

157) The method according to claim 156, wherein said composition further comprises a buffer that maintains pH of the composition at a range between about 4.0 and about 9.0.

158) The method according to claim 157, wherein said buffer comprises a reducing reagent.

159) The method according to claim 158, wherein said reducing reagent is dithiothreitol.

160) The method according to claim 157, wherein said buffer comprises a metal chelating reagent.

161) The method according to claim 160, wherein said metal chelating reagent is ethylenediaminetetracetic disodium salt.

162) The method according to claim 157, wherein said buffer is a citrate-phosphate buffer.

163) The method according to claim 155, further comprising a bactericidal or bacteriostatic agent as a preservative.

164) The method according to claim 155, wherein said lytic enzyme is lyophilized.

165). The method according claim 155, wherein said at least one lytic enzyme is present in a concentration of about 100 to about 500,000 active enzyme units per milliliter of fluid in the wet environment of the nasal or oral passages.

166) The method according to claim 165, wherein said at least one lytic enzyme is present in a concentration of about 100 to about 50,000 active enzyme units per milliliter of fluid in the wet environment of the nasal or oral passages.

167) The method according to claim 155, wherein said composition is administered parenterally.

168) The method according to claim 155, wherein said lytic enzyme is produced by

infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

169) The method according to claim 155, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

170) The method according to claim 169, wherein said transfer vector is a plasmid.

171) The method according to claim 169, wherein said expression system is a bacteria.

172) The method according to claim 171, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

173) The method according to claim 169, wherein said expression system is a cell free expression system

174) A composition for treating *Streptococcus pneumoniae*, comprising a lytic enzyme and a carrier, wherein the lytic enzyme is genetically coded by a bacteriophage specific for the *Streptococcus pneumoniae,* and wherein the enzyme is prepared by recombination.

175) The composition according to claim 174, wherein said transfer vector is a plasmid.

176) The composition according to claim 174, wherein said expression system is a bacteria.

177) The composition according to claim 176, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA

having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

178) The composition according to claim 176, wherein said expression system is a cell free expression system.

179) The composition according to claim 174, wherein said carrier is selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, nasal drops, nasal ointments, nasal washes, nasal injections, gels, nasal packings, lozenges, troches, candies, injectants, chewing gums, tablets, powders, sprays, injectants, powders, and liquids.

180) The composition according to claim 174, further comprising delivering a dry anhydrous version of the enzyme by an inhaler.

181) The composition according to claim 174, further comprising delivering a dry anhydrous version of the enzyme by a bronchial spray.

182) The composition according to claim 174, wherein said carrier is suitable for delivering the lytic enzyme parenterally.

183) The composition according to claim 174, wherein said carrier is suitable for delivering the lytic enzyme intravenously.

184) The composition according to claim 174, wherein said carrier is suitable for delivering said lytic enzyme intramuscularly.

185) The composition according to claim 174, wherein said carrier is suitable for delivering said lytic enzyme subdermally.

186) The composition according to claim 174, wherein said carrier is suitable for delivering said lytic enzyme intrathecally.

187) The composition according to claim 174, wherein said bacteriophage is selected from the group consisting of Dp-1, Dp-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ω-1, and ω-1.

188) The composition according to claim 187, wherein said bacteriophage is Dp-1.

189) The composition according to claim 174, further comprising an antibiotic.

190) A composition for treating an respiratory tract illnesses caused by *Streptococcus pneumoniae*, wherein said composition is formed by:

i) obtaining an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme lyses the cell wall of said *Streptococcus pneumoniae*; and

ii) incorporating said lytic enzyme into a carrier which can deliver said lytic enzyme to said mouth, throat, or nasal passage of a mammal.

191) The composition according to claim 190, wherein said composition further comprises a carrier selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, nasal ointments, nasal injections, gels, nasal packings, ointments, lozenges, troches, candies, injectants, chewing gums, tablets, powders, sprays, injectants, powders, intravenous solution, and liquids.

192) The composition according to claim 190, wherein said composition further comprises a buffer that maintains pH of the composition at a range between about 4.0 and about 9.0.

193) The composition according to claim 192, wherein said buffer comprises a reducing

reagent.

194) The composition according to claim 193, wherein said reducing reagent is dithiothreitol.

195) The composition according to claim 192, wherein said buffer comprises a metal chelating reagent.

196) The composition according to claim 195, wherein said metal chelating reagent is ethylenediaminetetracetic disodium salt.

197) The composition according to claim 192, wherein said buffer is a citrate-phosphate buffer.

198) The composition according to claim 192, further comprising a bactericidal or bacteriostatic agent as a preservative.

199) The composition according to claim 192, wherein said lytic enzyme is lyophilized.

200) The composition according claim 192, wherein said at least one lytic enzyme is present in a concentration of about 100 to about 500,000 active enzyme units per milliliter of fluid in the wet environment of the nasal or oral passages.

201) The composition according to claim 200, wherein said at least one lytic enzyme is present in a concentration of about 100 to about 50,000 active enzyme units per milliliter of fluid in the wet environment of the nasal or oral passages.

202) The composition according to claim 192, wherein said carrier is suitable for delivering said lytic enzyme parenterally.

203) The composition according to claim 192, wherein said lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

204) The composition according to claim 192, wherein said at least one lytic enzyme is

produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system..

206) The composition according to claim 204, wherein said transfer vector is a plasmid.

207) The composition according to claim 204, wherein said expression system is a bacteria.

208) The composition according to claim 190, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

209) The composition according to claim 204, wherein said expression system is a cell free expression system.

210) A composition for treating bacterial meningitis caused by *Streptococcus pneumoniae*, wherein said composition is formed by the method comprising the steps of:

i) obtaining an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*; and

ii) incorporating said lytic enzyme into a carrier which can deliver said lytic enzyme parenterally.

211) The composition according to claim 210, wherein said composition is administered parenterally.

212) The composition according to claim 210, wherein said composition is administered intravenously.

213) The composition according to claim 210, wherein said composition is administered subcutaneously.

214) The composition according to claim 210, wherein said composition is administered intramuscularly.

215) The composition according to claim 210, wherein said composition is administered intrathecally.

216) The composition according to claim 210, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

217) The composition according to claim 210, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

218) The composition according to claim 217, wherein said transfer vector is a plasmid.

219) The composition according to claim 217, wherein said expression system is a bacteria.

220) The composition according to claim 210, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

221) The composition according to claim 220, wherein said expression system is a cell

free expression system.

222) The composition according to claim 210, wherein said carrier is selected from the group consisting of distilled water, a saline solution, albumin, a serum, Ringer's solution, a buffered solution, a dextrose solution, and combinations thereof.

223) The composition according to claim 210, wherein said carrier comprises additives selected from the group consisting of p-hydroxybenzoates, stabilizers, fixed oils, ethyl oleate, neutral salts, dextrose, trehalose, dextrins, lactose, phosphate buffered saline, gelatin, albumin, vasoconstriction agents, organic acids organic acid salts, antioxidants, low molecular weight polypeptides, proteins, immunoglobulins, hydrophilic polymers, amino acids, monosaccharides, disaccharides, other carbohydrates including cellulose or its derivatives, glucose, chelating agents, sugar alcohols, counter-ions, non-ionic surfactants, glycerin, glycerol, DMSO, and combinations thereof.

224) A composition for treating eyes exposed to *Streptococcus pneumoniae* wherein said composition is formed by the method comprising the steps of:

a) obtaining an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*, and

b) incorporating said lytic enzyme into a carrier which can deliver said lytic enzyme to said eyes.

225) The composition according to claim 224, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

226) The composition according to claim 224, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

227) The composition according to claim 224, wherein said transfer vector is a plasmid.

228) The composition according to claim 224, wherein said expression system is a bacteria.

229) The composition according to claim 224,wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

230) The composition according to claim 226, wherein said expression system is a cell free expression system

231) The composition according to claim 24, wherein said carrier is selected from the group consisting of eye wash solution and eye drop solution.

232) The composition according to claim 224, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ϖ-1, and ϖ-2..

233) The composition according to claim 224, wherein said bacteriophage is Dp-1.

234) A composition for treating ear infections, wherein said composition is formed by the method comprising the steps of :

a) obtaining an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least

one lytic enzyme specifically lyses the cell wall of said *Streptococcus pneumoniae*, and

b) inserting said at least one lytic enzyme in a suitable carrier for delivering said *Streptococcus pneumoniae* to an ear canal.

235) The composition according to claim 234, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

236) The composition according to claim 234, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

237) The composition according to claim 236, wherein said transfer vector is a plasmid.

238) The composition according to claim 236, wherein said expression system is a bacteria.

239) The composition according to claim 234, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

240) The composition according to claim 236, wherein said expression system is a cell free expression system.

241) The composition according to claim 234, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ϖ-1, and ϖ-2.

242) The composition according to claim 234, wherein said bacteriophage is Dp-1.

243) The composition according to claim 234, further comprising an antibiotic.

244) The composition according to claim 234, wherein said carrier comprises ingredients selected from the group consisting of vitamins, minerals, carbohydrates, sugars, amino acids, proteinacious materials, fatty acids, phospholipids, antioxidants, phenolic compounds, isotonic solutions, oil based solutions, oil based suspensions, and combinations thereof..

245) A contact lens solution by *Streptococcus pneumoniae*, wherein solution is formed by the steps of:

a) obtaining an effective amount of at least one lytic enzyme genetically coded for by a bacteriophage specific for *said Streptococcus pneumoniae*, wherein said at least one lytic enzyme specifically lyses the cell wall of said Streptococcus pneumoniae, and

b) incorporating said at least one lytic enzyme into a solution used for cleaning contact lenses.

246) The contact lens solution according to claim 245, wherein said at least one lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

247) The contact lens solution according to claim 245, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system..

248) The contact lens solution according to claim 247, wherein said transfer vector is a plasmid.

249) The contact lens solution according to claim 247, wherein said expression system is a bacteria.

250) The contact lens solution according to claim 245, wherein said wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

251) The contact lens solution according to claim 245, wherein said expression system is a cell free expression system.

252) The contact lens solution according to claim 245, wherein said bacteriophage is selected from the group consisting of Dp-1, DP-4, Cp-1, Cp-7, Cp-9, Cp-5, MM1, EJ-1,HB-3, HB-623, HB-746, ω-1, and ω-2..

253) The contact lens solution according to claim 245, wherein said bacteriophage is Dp-1.

254) The contact lens solution according to claim 245, wherein said contact lens solution further comprising an antibiotic.

255) The contact lens solution according to claim 245, wherein said contact lens solution is an isotonic solution.

256) The contact lens solution according to claim 245, wherein said contact lens solution further comprises sodium chloride, sugar alcohols, borates, preservatives, and combinations thereof.

257) A method for the treating a lower respiratory tract illness caused by *Streptococcus pneumoniae*, comprising administering to a mouth, throat, nasal passage or lung of a mammal a composition comprising an effective amount of at

least one lytic enzyme genetically coded for by a bacteriophage specific for *Streptococcus pneumoniae*, wherein said at least one lytic enzyme lyses the cell wall of said *Streptococcus pneumoniae*.

258) The method according to claim 257, wherein said composition further comprises a carrier selected from the group consisting of nasal sprays, nasal drops, nasal inhalants, nasal ointments, nasal washes, nasal injections, gels, nasal packings, ointments, lozenges, troches, candies, injectants, chewing gums, tablets, powders, sprays, injectants, powders, intravenous solution, and liquids.

259) The method according to claim 257, wherein said composition further comprises a buffer that maintains pH of the composition at a range between about 4.0 and about 9.0.

260) The method according to claim 259, wherein said buffer comprises a reducing reagent.

261) The method according to claim 260, wherein said reducing reagent is dithiothreitol.

262) The method according to claim 259, wherein said buffer comprises a metal chelating reagent.

263) The method according to claim 262, wherein said metal chelating reagent is ethylenediaminetetracetic disodium salt.

264) The method according to claim 259, wherein said buffer is a citrate-phosphate buffer.

265) The method according to claim 257, further comprising a bactericidal or bacteriostatic agent as a preservative.

266) The method according to claim 257, wherein said lytic enzyme is lyophilized.

267) The method according claim 257, wherein said at least one lytic enzyme is present in

a concentration of about 100 to about 500,000 active enzyme units per milliliter of fluid in the wet environment of the nasal or oral passages.

268) The method according to claim 257, wherein said at least one lytic enzyme is produced by recombinant production from a nucleic acid that comprises a DNA having the sequence of bases 3687 to 4577 of SEQ ID No. 2 or a sequence that hybridizes with the complement of bases 3687 to 4577 of SEQ ID No. 2 under stringent hybridization conditions.

269) The method according to claim 259, wherein said composition is administered parenterally.

270) The method according to claim 257, wherein said lytic enzyme is produced by infecting said *Streptococcus pneumoniae* with a bacteriophage specific for said *Streptococcus pneumoniae*.

271) The method according to claim 257, wherein said at least one lytic enzyme is produced by removing a gene for the lytic enzyme from the phage genome, putting said gene into a transfer vector, and cloning said transfer vector into an expression system.

272) The method according to claim 271, wherein said transfer vector is a plasmid.

273) The method according to claim 271, wherein said expression system is a bacteria.

274) The method according to claim 273, wherein said bacteria is selected from the group consisting essentially of *E. coli* and *Bacillus*. .

275) The method according to claim 271, wherein said expression system is a cell free expression system